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PROSPECTS OF THE BEAVER INDUSTRY IN THE U.S.S.R.

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The beaver, an important commercial animal, belongs to the family of rodents. Its weight reaches 26-27 kg. The beaver differs from the majority of rodents in its family manner of life and seasonal propagation, and also in that young beavers are not born naked but well covered with fur, with open eyes and incisors cut.

Beavers live in large and friendly families, which consist of the male, female, yearlings and the young of the same year. The female has her young once a year, in litters of 1 to 5. A family may consist of up to 10-12 beavers, but on the average their number does not exceed 4-5. At the age of 2, the beavers, usually in the season of high spring water, leave the family in search of new places. During the first year they usually lead a vagrant life, but then, after having found a habitat and a mate, the young animals form a new family, which will not, as a rule, disintegrate unless one of its founders perishes.

Water is a necessary and obligatory condition for the existence of the beavers; therefore, their life is closely connected with some water reservoir and its shore.

In steep embankments beavers dig deep underground labyrinths; in places where shores are low and muddy, they build surface structures from sticks, branches and mud, called "houses" or "huts" ("lodges"). In both cases the beaver's den is only accessible from under the water, as the central exits from the den are built deep below the surface.

The beavers are vegetarians and lead a nocturnal way of life. By day they sleep in their dens, and with the darkening twilight go out for feeding. Favourite food of the beavers are green bark, branches and leaves of the aspen and willow. Branches of these trees are stored by the beavers in considerable amounts for the winter; they lay them down in a deep place, close to the central lairs in piles 3-4 cubic m. in volume. In addition to the branches stored underwater, during the winter the beavers feed on roots of the underwater plants (reed, rush, water-lily, etc.) which they pick up swimming under the water.

With the beginning of summer, the beavers gradually stop eating arboreous food and switch almost exclusively to juicy broad-leaved herbs; first of all meadowsweet, water avens, goutweed, nettles and many others.

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In the remote past the beaver was extremely wide-spread and could be found all over Europe, Northern and Central Asia and America.

Russia was especially famous for its beaver pelts; for a long time Russia was the main supplier of beaver to Europe, the countries of the Middle East and Asia. But primitive methods of conservation, lack of responsibility, and in a number of cases also predacious over-hunting, quickly exhausted the reserves of this valuable animal and resulted in almost complete extermination of the beavers. First of all beavers vanished in England, where already in the twelfth century only single individuals could be found; in the sixteenth century they became extinct in Italy, in the seventeenth century, in Holland and in most provinces of Central Russia.

The beaver pelt has long been famous for its beauty, lightness and durability. Also highly valued was the beaver's fur, used for the manufacture of top-quality felt. In the sixteenth and seventeenth centuries, hunters especially collected the beaver fur, using for this purpose rejected, torn and not fully furred pelts. One adult beaver pelt yielded 750-875 gr. fur (Grawe, 1931). This quantity was sufficient for the production of 18 especially expensive beaver hats[1].

Beaver meat was used as a delicacy.

In past centuries a highly valuable product of beaver hunting was castor, i.e. the secretion of odoriferous glands located at the root of the beaver's tail and secreting an aromatic liquid with a very strong odour. A pair of these glands from an adult beaver weighs 100-160 gr.

Castor was widely used as a medical preparation and was, therefore, in great demand. In the past two centuries, castor has been widely used in the perfume industry for the production of expensive perfume. The almost complete extermination of the beaver must be essentially ascribed to castor. Pitiful remains of the vast beaver colonies of old times were preserved in pre-revolutionary Russia only in the flood areas of the Dnieper and Voronezh Rivers, also in Siberia, in the river systems of the Konda and Sosva, and along the upper reaches of the Yenisei.

The Soviet Government, considering the high commercial value of the river beaver, took measures in the first years of Soviet rule to save the animal from extinction, despite ruinous economic conditions.

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[1] Translator's Note: According to data of the Voronezh Sanctuary, from one skin of an adult beaver 350-400 gr. of fur can be obtained.

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In 1922, by decree of the Council of People's Commissars of the R.S.F.S.R., all kinds of beaver hunting were strictly prohibited, offenders to be punished severely.

Due to this measure the number of river beaver increased greatly; soon it became possible to stock with beaver many new areas of the Republic. The first step in solving this great and complicated problem was the organization of the Voronezh State Beaver Sanctuary, whose purpose it was not only to conserve the beaver, but also to study them thoroughly and propagate them all over the U.S.S.R. In the first ten years after the establishment of the sanctuary, its beaver colony grew from a few score to several hundreds of individuals; thus a real opportunity appeared to thin them out partly and resettle the surplus.

Beginning in 1934, the sanctuary stock was thinned out every year according to plan, and animals were sent to the different republics, krai's and oblasts for acclimatization. As a result, within 10 years the stock of beaver in the U.S.S.R. reached more than 5,000 individuals, and their number is steadily growing. In a short time the Voronezh beavers populated 23 oblasts, 4 Union republics and a foreign democratic republic.

At the same time the Voronezh Sanctuary succeeded in working out new methods for the increase of the numbers of these animals by taming and raising them in pens on special beaver farms.

Successful settlement of the beavers in our country, the experience of the Voronezh Sanctuary in beaver breeding under natural conditions, also the solution of the problem of the beaver propagation in special farms, now make it possible to consider controlled hunting and increasing the capacity of beaver reservations. Hunting, of course, must be strictly controlled and restricted and not extended to all places where beavers live, but only to special areas allotted for the purpose. Therefore, in continuing the work of wide-spread beaver propagation, we consider it timely and necessary to organize special state commercial beaver farms of the "intensive" type, with compulsory selection, regular counts of the population, and combination of biotechnical measures to improve the supply of food and the living conditions, so that maximum productivity is ensured.

Such farms will be conveniently organized in the central part of the U.S.S.R. by releasing once or annually groups of beavers of up to 150-200 pairs, the animals to be caught for this purpose in the sanctuaries.

On the basis of counts of the beaver stock in sanctuaries over several years, it can be assumed that the expected growth of stock in commercial farms in the course of the first three years from their start, will be expressed as follows (Tables 1 and 2).

Table I - Growth and composition of beaver stock under natural conditions (according to data of the Voronezh Sanctuary)

Period of operation of farm	Beavers on farm during the year					Yield per year	Beaver stock at end of yea
	Breeders	2-year -olds	Yearlings	Young of the year	Total		
Year of planting....	440	-	-	-	400	-	400
1st year....	400	-	-	300	700	-	700
2nd year....	400	-	160	300	860	-	860
3rd year....	400	140	160	300	1000	140	860

NOTES:
(1) 10 per cent decrease due to outside resettling.
(2) Average progeny per registered female, 1.5 individuals.
(3) Loss of breeders by natural death is covered by fresh animals in the process of stock rotation.
(4) Mortality of animals born in same year is 45 per cent.
(5) Mortality of yearlings, 15 per cent.
(6) Average number in family at the end of the year - 4.5 on the average.
(7) Average age of the beavers in the Voronezh State Sanctuary taken from thinning-out data.

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Thus one commercial beaver farm with a productive stock of 200 pairs is able annually to deliver to the state, without prejudice to the basic stock, up to 300 beaver pelts, 30 kg. dry castor and, as a by-product, 2 tons of meat and fat.

Certain measures must be taken in organizing commercial fur farms. The following measures should be carried out in the first year of the existence of the farm:

1. Boundaries of the farm must be defined, settlements of beavers distributed, capacity of the feeding grounds determined.
2. In the autumn, the beavers must be counted to determine the number per family and of the entire colony.
3. Basic breeder families and hunting sections must be marked on the basis of stocktaking and evaluation of feeding ground capacity.
4. Extra food for the beavers must be supplied in places where food is inadequate.
5. Trees must be planted and basins reconstructed.
6. Wolves and other beasts of prey must be destroyed.

Table II - Rough estimate of the development and composition of beaver stock on a commercial farm, during three years after completing the formation of the productive stock (optimum variant)

Period of operation of farm	Beavers on farm during the year					Yield per year	Remainder at end of year
	Breeders	2-year -olds	Yearlings	Young of the year	Total		
Year when the group was formed	440	-	-	-	440	-	400
1st year..	400	-	-	400	800	-	800
2nd year..	400	-	300	400	1100	-	1100
3rd year..	400	270	300	400	1370	270	1100

NOTES:
(1) 10 per cent decrease due to mortality and outside resettlement.
(2) Average progeny 2.0 per female.
(3) Loss by natural death of breeders covered by fresh animals in the process of stock rotation.
(4) Mortality of animals born the same year-25 per cent.
(5) Mortality of yearlings-10 per cent.
(6) Average number in family at end of year-5.5.
(7) Age composition: breeders-30 per cent; two-year olds-19 per cent; yearlings-21 per cent; young of the year- 30 per cent.

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In the second year:

1. Spring stocktaking of beavers during the high-water period to establish the qualitative and quantitative composition of the population after wintering.

2. Check-up on the ways of migration of the growing youngsters.

3. Thinning out of the migrating beavers, and their resettlement in free waters to increase as quickly as possible the farm population up to the quota figures.

4. Arrangement and equipment of trapping grounds lying across the routes where beavers migrate most frequently.

5. Combination of biotechnical measures to ensure maximum density of the beaver population. If necessary, the possibility must be provided of moving certain beaver from areas in order to restore and increase the supply of food, also to carry out meliorations.

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The following are regular annual measures:

1. Protection of the beavers against beasts of prey and poachers.

2. A combination of biotechnical measures for the purpose of improving living conditions for breeder families and farm operation.

3. Fall stocktaking by families and for the entire colony, so that hunting quotas may be specified.

4. Selection work among breeder stock, thinning out and rejection and keeping the farm pedigree.

5. Organized hunting, skinning and pelt dressing; castor collection.

6. Fur sorting and shipment for processing.

We think that the time has already come to use the country's stock of the river beaver for the benefit of the national economy. However, considering the beaver's biological peculiarities (family life and monogamy), it is inadmissible to start hunting by usual means, issuing licenses for hunters. This has resulted in the past in extermination of the beavers, because beaver families are broken up and cannot be restored for a long time.

On commercial beaver farms a basic stock of producing families should be singled out so that they are evenly distributed over a limited area. The breeders will comprise a protected breeding stock, subject to regular selection. The living conditions of the breeders should be systematically improved. Hunting will be carried out along the ways of the animals' migration, and will therefore only affect fully developed young animals which have reached sexual maturity and left their parents.

Renovation of the basic stock of breeders and the necessary selection should be based on a firm production plan, taking into consideration accurate data about the reproductive capacity of every pair; the animals must be caught off alive. The proposed network of beaver farms should, of course, be placed under the control of a central organization.

This, in our opinion should be the Board of Wildlife Sanctuaries of the U.S.S.R. Ministry of Agriculture and Procurement, which already has great practical and scientific experience in the re-acclimatization of beavers. In order to deal on a nation-wide scale with the complex and important task of organizing the fur industry on entirely new principles, it will be expedient to organize a few experimental farms which will clarify the problems of organization and methods and draw up a standard project for a commercial beaver farm.